WHAT IS CLAIMED IS:

1. A method for producing a p-type gallium nitride-based compound semiconductor comprising:

producing a gallium nitride-based compound semiconductor layer doped with a p-type impurity;

producing a catalyst layer comprising a metal, alloy or compound on said gallium nitride-based compound semiconductor layer; and

annealing the gallium nitride-based compound semiconductor layer fixed with said catalyst layer.

2. The method for producing a p-type gallium nitride-based compound semiconductor as claimed in claim 1, wherein said catalyst layer comprises a metal, alloy or compound having a smaller heat of formation for a metal hydride compound than that of the p-type impurity.

3. The method for producing a p-type gallium nitride-based compound semiconductor as claimed in claim 2, wherein said catalyst layer is a monolayer or multilayer film comprising a metal, alloy or compound containing at least one element selected from the group consisting of Ni, Co, Fe, Mn, Cr, V, Ti, Re, W, Ta, Hf, Lu, Gd, Ce, La, Ru, Mo, Zr, Y, Au, Ag, Cu, Al and Bi.

4. The method for producing a p-type gallium nitride-based compound semiconductor as claimed in claim 2, wherein said catalyst layer is a monolayer or multilayer film comprising a metal, alloy or compound containing Ni.

5. The method for producing a p-type gallium nitride-based compound semiconductor as claimed in any one of claims 1 to 4, wherein said annealing is performed at a temperature of 200°C or more.

6. The method for producing a p-type gallium nitride-based compound semiconductor as claimed in any one of claims 1 to 4, which further comprises stripping the catalyst layer after said annealing.

7. The method for producing a p-type gallium nitride-based compound

semiconductor as claimed in any one of claims 1 to 4, wherein said catalyst layer has a film thickness of 1 to 100 nm.

8. A method for producing a gallium nitride-based compound semiconductor light-emitting device comprising providing an n-type layer and a light-emitting layer each comprising a gallium nitride-based compound semiconductor, and providing a p-type layer comprising a gallium nitride-based compound semiconductor through the following steps:

producing a gallium nitride-based compound semiconductor layer doped with a p-type impurity;

producing a catalyst layer comprising a metal, alloy or compound on said gallium nitride-based compound semiconductor layer;

annealing the gallium nitride-based compound semiconductor layer fixed with said catalyst layer; and

stripping said catalyst layer.

9. The method for producing a gallium nitride-based compound semiconductor light-emitting device as claimed in claim 8, wherein said catalyst layer comprises a metal, alloy or compound having a smaller heat of formation for a metal hydride compound than that of the p-type impurity.

10. The method for producing a gallium nitride-based compound semiconductor light-emitting device as claimed in claim 9, wherein said catalyst layer is a monolayer or multilayer film comprising a metal, alloy or compound containing at least one element selected from the group consisting of Ni, Co, Fe, Mn, Cr, V, Ti, Re, W, Ta, Hf, Lu, Gd, Ce, La, Ru, Mo, Zr, Y, Au, Ag, Cu, Al and Bi.

11. The method for producing a gallium nitride-based compound semiconductor light-emitting device as claimed in claim 9, wherein said catalyst layer is a monolayer or multilayer film comprising a metal, alloy or compound containing Ni.

12. The method for producing a gallium nitride-based compound semiconductor light-emitting device as claimed in any one of claims 8 to 11, wherein said annealing is performed at a temperature of 200°C or more.

13. The method for producing a gallium nitride-based compound semiconductor light-emitting device as claimed in any one of claims 8 to 11, wherein said catalyst layer has a film thickness of 1 to 100 nm.

14. A gallium nitride-based compound semiconductor light-emitting device comprising an n-type layer, a light-emitting layer and a p-type layer each comprising a gallium nitride-based compound semiconductor, wherein said p-type layer is formed by providing a catalyst layer comprising a metal, alloy or compound on a gallium nitride-based compound semiconductor layer doped with a p-type impurity, annealing the gallium nitride-based compound semiconductor layer fixed with said catalyst layer, and stripping the catalyst layer, wherein the p-type impurity in the p-type layer is activated.